

CLAIMS

What is claimed is:

1. A statechart for use in the development of avionic software, the avionic software requiring deterministic behavior, the statechart comprising:  
a first state;  
a second state; and  
a third state, the third state including the first state and the second state, the first state being parallel to the second state, wherein the first state is ordered with respect to the second state, whereby the statechart does not allow parallel states to be unordered to ensure the deterministic behavior of the statechart.

2. The statechart of claim 1 further comprising:  
a fourth state in parallel with the first state and the second state and included within the third state, the third state being ordered with respect to the first state and the second state.

3. The statechart of claim 2 further comprising:  
a fifth state in parallel with the first state, the second state and the fourth state and included within the third state, the fourth state being ordered with respect to the first state and the second state and the third state.

4. The statechart of claim 1 further comprising:  
a history element disposed in the third state, the history element ensuring that the last exited state of the first state, and the second state is entered when the third state is entered.

5. The statechart of claim 4 wherein the history element includes a default setting indicating the first state or the second state.

*Sub B3*  
6. The statechart of claim 1 wherein the avionic software is a graphical flight planner.

*Sub A1*  
7. A modified Harel statechart formed on a computer, the modified Harel statechart comprising:  
a mathematical or graphical representation of a group of states, the group of states including a first state including a plurality of ordered parallel states, the mathematical representation ensuring deterministic operation.

8. The modified Harel statechart of claim 7 wherein the ordered parallel states include history elements.

*Sub A1*  
9. The modified Harel statechart of claim 8 wherein the group of states are represented mathematically and graphically.

10. A computer code for a statechart editor, the computer code comprising:  
code for generating a graphical representation of a state including parallel states;  
and  
code for ordering the parallel states.

11. The computer code of claim 10 wherein the parallel states are ordered to provide determinism for an avionic system.
12. The computer code of claim 10 further comprising:  
code for preventing the entry of a non-ordered parallel state.
13. The computer code of claim 10 further comprising code for providing a graphical representation of the ordering, the graphical representation of the ordering being a placement of the ordered parallel states or textual indication of the ordered parallel states.
14. A method of providing avionic software, the method comprising:  
providing a graphical representation of a state including a plurality of parallel states, the parallel states being ordered with respect to each other, the parallel states being ordered so that only one of the parallel states is active in response to a particular event; and  
applying the mathematical or graphical representation to an execution engine to create the avionics software.
15. The method of claim 14 wherein the avionics software is fully deterministic.
16. The method of claim 15 wherein the graphical representation is a modified Harel statechart.

17. A statechart for use in the development of software for an application, the statechart comprising:

a first state means for representing a first condition of the software in the application;

a second state means for representing a second condition, the second condition being within the first state means;

a third state means for representing a third condition, the third condition being within a first state means, the third state means being ordered with respect to the second state means.

18. The statechart of claim 17 wherein the second state means and the third state means are entered upon occurrence of a same event.

19. The statechart of claim 18 wherein the first state means, the second state means and the third state means include a history element.

20. The statechart of claim 17 wherein the application is avionic control and the statechart is deterministic.